In the Claims:

The claims are as follows:

1. (Withdrawn) A method of fabricating a filled trench structure, comprising:

(a) forming a first set of trenches in a first region of a substrate and forming a second set of trenches in a second region of said substrate, trenches in said first set of trenches having a higher aspect ratio than said trenches in said second region;

(b) depositing a fill material in said first and second set of trenches and on a top surface of said substrate, said fill material completely filling said trenches;

(c) removing an upper portion of said fill material; and

(d) removing, using a planarization process, all fill material from said top surface of said substrate, a top surface of said fill material in said first and second sets of trenches co-planer with said top surface of said substrate.

2. (Withdrawn) The method of claim 1, wherein step (c) includes wet etching, dry etching, reactive ion etching or plasma etching of said fill material

3. (Withdrawn) The method of claim 1, wherein step (c) includes chemical-mechanical polishing or fixed abrasive grinding said fill material.

4. (Withdrawn) The method of claim 1, further including:

between steps (b) and (c) forming a mask layer on said fill material said second region, wherein in step (c) fill material is only removed from said first region; and

between steps (c) and (d) removing said masking layer.

5. (Withdrawn) The method of claim 4, wherein step (c) removes about 5 to 20% of an as deposited thickness of said fill material.

6. (Withdrawn) The method of claim 1, wherein the aspect ratio of trenches in said first set of trenches is greater than about 3:1 and the aspect ratio of trenches in said second region is less than about 3:1.

7. (Withdrawn) The method of claim 1, wherein said first region is a memory cell array region and said second region is a support circuit region of an integrated circuit.

8. (Withdrawn) The method of claim 1, wherein said fill material is selected from the group consisting of: high-density plasma oxide, low-pressure chemical vapor deposition oxide, tetraethoxysilane oxide, silicon nitride, bis(tertiary-butylamine)silane, a thin layer of conformal insulator and a fill layer of N-doped, P-doped or un-doped polysilicon, tungsten, copper or aluminum.

9. (Withdrawn) The method of claim 1, wherein the volume of fill material removed in step (c) is experimentally pre-determined to be a volume that allows removal in step (d) of all of said fill material from said top surface of said substrate in both said first and second regions in a predetermined amount of chemical-mechanical-polish or grind time.

10. (Withdrawn) The method of step 1, wherein step (c) removes about 5 to 20% of the as deposited thickness of said fill material.

11. (Previously Presented) A method of fabricating a filled trench structure, comprising:

(a) forming a planarization stop layer on a top surface of a substrate;

(b) forming a first set of trenches in a first region of said planarization stop layer and said substrate and forming a second set of trenches in a second region of said planarization stop layer and said substrate, trenches in said first set of trenches having a higher aspect ratio than said trenches in said second region;

(c) depositing a layer of a fill material in and over said first and second sets of trenches and on a top surface of said planarization stop layer, said fill material completely filling said trenches;

(d) after step (c), removing, using a wet etching, a dry etching, a reactive ion etching or a plasma etching process, an uppermost layer of said fill material from over said first and second sets of trenches and said top surface of said planarization stop layer, a thinned layer of said fill material remaining over said first and second sets of trenches and on said top surface of said planarization stop layer, said fill material still completely filling said first and second sets of trenches; and

(e) after step (d), removing, using a planarization process, all said fill material from said top surface of said planarization stop layer and over said first and second set of trenches, a top surface of said fill material in said first set of trenches and a top surface of said fill material in said second sets of trenches co-planer with said top surface of said planarization stop layer.

12. (Canceled)

13. (Previously Presented) The method of claim 11, wherein in step (e) said planarization process includes chemical-mechanical polishing or fixed abrasive grinding.

14. (Original) The method of claim 11, further including:

between steps (c) and (d) forming a mask layer on said fill material in said second region, wherein in step (d) fill material is only removed from said first region; and

between steps (d) and (e) removing said masking layer.

15. (Original) The method of claim 14, wherein step (d) removes about 5 to 20% of an as deposited thickness of said fill material.

16. (Original) The method of claim 11, wherein the aspect ratio of trenches in said first set of trenches is greater than about 3:1 and the aspect ratio of trenches in said second region is less than about 3:1.

17. (Original) The method of claim 11, wherein said first region is a memory cell array region and said second region is a support circuit region of an integrated circuit.

18. (Original) The method of claim 11, wherein said fill material is selected from the group consisting of: high-density plasma oxide, low-pressure chemical vapor deposition oxide, tetraethoxysilane oxide, silicon nitride, bis(tertiary-butylamine)silane, a thin layer of conformal

insulator and a fill layer of N-doped, P-doped or un-doped polysilicon, tungsten, copper or aluminum.

19. (Original) The method of claim 11, wherein the volume of fill material removed in step (d) is experimentally pre-determined to be a volume that allows removal in step (e) of all of said fill material from said top surface of said substrate in both said first and second regions in a predetermined amount of chemical-mechanical-polish or grind time.

20. (Previously Presented) The method of claim 11, wherein step (d) removes about 5 to 20% of the as deposited thickness of said fill material.

21. (Previously Presented) The method of claim 11, wherein step (d) reduces the difference between a volume of said fill material over first region and a volume of said fill material over said second region.

22. (Previously Presented) A method of fabricating a filled trench structure, comprising:

(a) forming a planarization stop layer on a top surface of a substrate;

(b) forming a first set of trenches in a first region of said planarization stop layer and said substrate and forming a second set of trenches in a second region of said planarization stop layer and said substrate, trenches in said first set of trenches having a higher aspect ratio than said trenches in said second region;

(c) depositing a layer of a fill material in and over said first and second sets of trenches and on a top surface of said planarization stop layer, said fill material completely filling said trenches;

(d) after step (c), removing, using a non-planarization process, an uppermost layer of said fill material from over said first and second sets of trenches and said top surface of said planarization stop layer, a thinned layer of said fill material remaining over said first and second sets of trenches and on said top surface of said planarization stop layer, said fill material still completely filling said first and second sets of trenches; and

(e) after step (d), removing, using a planarization process, all said fill material from said top surface of said planarization stop layer and over said first and second set of trenches, a top surface of said fill material in said first set of trenches and a top surface of said fill material in said second sets of trenches co-planer with said top surface of said planarization stop layer.

23. (Previously Presented) The method of claim 22, wherein in step (d) said non-planarization process includes a wet etching, a dry etching, a reactive ion etching or a plasma etching process.

24. (Previously Presented) The method of claim 22, wherein in step (e) said planarization process includes chemical-mechanical polishing or fixed abrasive grinding.